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EVALUATIVE TEACHING STRATEGIES IN THE SOCIAL STUDIES.

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REPORT NUMBER BR-6-8423 PUB DATE APR 67
EDRS PRICE MF-$0.50 HC-$3.60 88P.

DESCRIPTORS- *SOCIAL STUDIES, *TEACHING TECHNIQUES, *VALUES, *HIGH SCHOOL STUDENTS, EVALUATION TECHNIQUES, *STUDENT ATTITUDES

A SIMULTANEOUS APPROACH WAS USED IN AN EXPLORATORY STUDY OF THREE MAJOR INSTRUCTIONAL PROBLEMS THAT ARE ENCOUNTERED IN TEACHING VALUE PROBLEMS IN TWO SOCIAL STUDIES TOPICS ON ENVIRONMENTAL CONTAMINATION--FLOURIDATION AND THE USE OF PESTICIDES. "VALIDITY" WHICH IS CONCERNED WITH THE APPROPRIATE CRITERIA FOR MAKING VALUE JUDGMENTS WAS STUDIED BY VARYING THE DEGREE AND KIND OF SUPPORT FOR THE VALUE JUDGMENTS. "JUSTIFICATION" WHICH IS CONCERNED WITH THE LEGITIMATE COURSES OF ACTION THE TEACHER MAY EMPLOY TO TEACH OBJECTIVES FOR VALUE PROBLEMS WAS INVESTIGATED BY PRESENTING AUTHENTIC FACTS WITH NO INDOCTRINATION, DECEPTION, OR PROPAGANDA TECHNIQUES. "EFFECTS" WHICH IS CONCERNED WITH THE CONSEQUENCES OF THE COURSES OF ACTION A TEACHER EMPLOYS WAS INVESTIGATED BY THE USE OF FOUR TEACHING STRATEGIES CONSTRUCTED TO PRODUCE A RATING OF A PRACTICE WITH RESPECT TO ITS WORTH, GOODNESS, OR CORRECTNESS. THE STRATEGIES (CORE, ANALOGY, AUTHORITY, AND CRITERION) WERE PRESENTED IN WRITTEN FORM TO 303 GRADE 11 STUDENTS. RESULTS WERE MEASURED BY SEMANTIC DIFFERENTIAL SCALES, MULTIPLE-CHOICE TESTS, AND FREE RESPONSE TESTS. THERE WAS A RELATIVELY CONSISTENT PATTERN OF DIFFERENCES ON THE OUTCOME MEASURES AMONG THE FOUR STRATEGY GROUPS. THE DIFFERENCES DEPENDED ON THE TOPIC. IN GENERAL, THE GROUPS SHOWED MORE CONCERN WITH THE EFFECTIVENESS THAN THE HARMFULNESS OF FLUORIDATION AND MORE CONCERN WITH THE HARMFULNESS THAN THE EFFECTIVENESS OF PESTICIDES. THE CRITERION GROUP REACTED MORE NEGATIVELY TO FLUORIDATION AND TO SOME ASPECTS OF THE USE OF PESTICIDES THAN THE OTHER GROUPS. (AL)

BR 6-8423
PA.24

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ED013977

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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The research reported herein is the Final Report of Contract No. N1. 6-8423 of the Cooperative Research Program of the U.S. Office of Education, U.S. Department of Health, Education, and Welfare

AA000245

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ACKNOWLEDGMENT

We would like to extend our deep appreciation to the teachers, principals, and district office personnel in the Granite School District whose generous cooperation and contribution of time made this study possible. Special appreciation is due Dr. Elmer V. Hartvigsen, Superintendent, Mr. Carlos Asay, Director of Social Studies, and Dr. Reed Call, Director of Pupil Personnel.

We would like to express our appreciation to Roland Payette for his invaluable assistance in developing our tests.

We would also like to thank Dr. W. B. Angleman, who spent many long and helpful hours in developing the coding system, categorizing responses with the system, and interpreting the results.

Finally, we would like to thank Barbara Smith for her help in duplicating the report, and especially Janet Ward for her excellent secretarial assistance throughout much of the project.

ERRATA

Page 11, line 10. Delete the sentence 'The horizontal line . . .'.

Appendix VIII. Should read 'Appendix VII'.

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INTRODUCTION

Value problems have been troublesome in the teaching of the social studies for a considerable period of time. Although a variety of problems arise in the teaching of value problems, the problems can be classified into three main kinds. These may be designated briefly as the problem of validity, the problem of justification, and the problem of effects. The problem of validity is a "logical" or conceptual one, and is concerned with the appropriate criteria for making value judgments. The problem of justification is an "ethical" one, and is concerned with the legitimate courses of action the teacher may employ to teach agreed-upon objectives for value problems. The problem of effects is an "empirical" problem, and is concerned with the effects (consequences) of the courses of action the teacher does employ.

A variety of recent developments now provide a much sounder approach to all three of these problems, including some of the relations among the problems.

The problem of validity has been clarified in some of the recent work in analytic philosophy in the areas of informal logic and value theory (e.g., Toulmin (1958), Von Wright (1963), and Nowell-Smith (1954)).

The problem of justification has been clarified in recent work on analytic philosophy, especially in ethical theory (e.g. Frankena (1963) and Castaneda & Nahknikian (1963)) and philosophy of education and analyses of teaching (e.g. Scheffler (1965) and Green (1964)).

The problem of effects can now be approached more soundly. Increased work in the theory and measurement of attitudes and attitude change is one relevant area (e.g. Oppenheim (1966) and Shaw & Wright (1967)). A second area is the development of new classroom observation systems

(Medley & Mitzel (1963) and Meux (1967)). A third area is increased sophistication in research design (e.g., Winer (1962) and Campbell & Stanley (1963)) and multivariate analysis (e.g., Cattell (1966)). Finally, the area of measurement and measurement theory has been increasingly refined, as exemplified in works on construct validity (e.g., Cronbach & Meehl (1955) and Loevinger (1957)), generalizability theory (Cronbach et al. (1963)), and the multitrait-multimethod matrix (Campbell & Fiske (1959)).

This study is an initial and exploratory effort at a simultaneous approach to the problems of validity, justification, and effects as they arise in teaching two environmental contamination topics, fluoridation and use of pesticides.

The simultaneous approach to these three problems may be described briefly as follows:

Validity. Here we will vary the degree and kind of support for the value judgments, with three appropriate kinds of criteria developed for the maximum support. The use of the model of evaluation described by Meux (1963, 1966) is useful for this purpose.

Justification. Here we will present authentic facts in a straightforward, "rational" way, with no indoctrination, deception, or propaganda techniques.

Effects. Here our approach to the four areas described above is as follows.

New classroom observation systems. The system for analysis of teaching strategies, developed by Smith et al. (1964), is the basis of the construction of evaluative teaching strategies - strategies in which the central objective is to rate some object, event, practice, etc., with respect to its worth, goodness, correctness, etc.

Attitude change. The semantic differential (Csgood et al. (1957)) is used to assess attitude change.

Multivariate analysis. Although a rigorous multivariate analysis is not conducted, we have used more than one independent variable and more than one dependent variable.

Measurement. A generalizability and multitrait-multimethod matrix approach used for a variety of outcomes. (However, due to limited time and missing data the intended analyses for these approaches were not carried out fully.)

Chapter I

Procedure

The general procedure for the experiment can be described in terms of six "elements" of the instructional system: topic, strategy, teacher, students, conditions, and outcomes.

Topic. We chose the area of environmental contamination (EC) from which to select two topics, fluoridation and use of pesticides. Two factors were important in the choice of EC topics. First, this is an area of increasing concern in our society and probably would be in any advanced industrial society. Second, the topics in this area pose interesting problems in the appropriate criteria, which involve a combination of health, welfare, rights, and economic questions. Fluoridation and use of pesticides, then, are value objects in the strategies.

Strategies. We decided to have four strategies presented in written form (to minimize the influence of group interaction on our measured outcomes) and varying in degree and kind of support or justification for the rating. The value term was 'inadvisable' for both value objects, fluoridation and use of pesticides. Thus the ratings are 'Fluoridation is inadvisable' and 'The use of pesticides is inadvisable'. The first strategy, called the Core, contained as support only somewhat relevant Description moves[1]; this strategy provides only weak support for the rating.

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[1] A strategy is composed of a sequence of moves with a central point or objective. A move is a unit of information relevant to achieving the objective of the strategy. See Appendix I for Evaluative moves.

The second strategy contained the Core plus Citing Authority moves; this strategy provides somewhat stronger support for the rating than just the Core. The third strategy contains the Core plus Analogy moves; this strategy provides somewhat stronger support for the rating than just the Core. The fourth strategy contains the Core plus Criterion and associated Description moves; this strategy provides the strongest support of all, in fact the strongest possible (aside from combining different kinds of support or adding several Description plus Criterion moves together). Separate and comparable strategies were constructed for the two value objects.

Teachers. No teachers are involved in the experiment, since the strategies are in written form, to be read by the student.

Students. Ss were 11th-grade Social Studies students in the Granite School District of Salt Lake County. Two schools were used, with differences in average socioeconomic background. (N = 303.)

Conditions. The experiment was conducted in the regular classroom (the regular teacher left the room, and the test booklets were administered by the principal investigator and an assistant). No attempt was made to control the group or students or any theoretical variables or dimensions. The students were instructed to suppose that the material was like that found in a typical classroom.

Outcomes. A number of outcomes were tested, including identification of value judgments, knowledge of material in the strategy, judgment of the most telling point against the value object, decisions about actions on fluoridation (or pesticides), transfer of criteria to new situations (within and outside of EC area), etc. Both multiple-choice and free-response items were used. Changes in connotative meaning on three dimensions,

Evaluative, Potency, and Activity, were assessed with the Semantic Differential (SD). The Evaluative dimension is considered a measure of attitude (Osgood et al., 1957).

Construction of Strategies

The main objective in constructing the strategies was to vary the degree and kind of support (justification) for the rating in the strategy. The rating for both Fl and Pst was "inadvisable." An unfavorable rating was chosen because an informal check of opinion indicated a predominance of favorable attitudes toward both fluoridation and use of pesticides. This predominance of favorable attitudes would presumably provide an opportunity for obtaining larger effects of the strategies.

The variation in <u>degree</u> of support was obtained as follows. The least amount of support was provided by some Description moves which implied weak support of the rating. The greatest amount of support was provided by Criterion moves in combination with the relevant Description moves (Meux, 1966). A degree of support between these two extremes was provided by Citing Authority moves or Analogy moves.

The variation in <u>kind</u> of support was obtained as follows. Citing Authority moves provide direct support for a rating of the value object under consideration, rather than some other value object. However, this kind of support is always somewhat weak and inconclusive because another authority can always give an opposite rating. Analogy moves give indirect support for a rating by assuming a rating of a value object different than the one under discussion, then claiming the two value objects are alike. However, this kind of support is weak because the two value objects may be different in

crucial respects that would result in different ratings. Criterion plus appropriate Description moves give direct and maximum support for a rating, since the support is basically like the support of a conclusion from the major and minor premise in a syllogism (ibid.).

No attempt was made at this stage of experimentation to separate degree and kind of support, so the two are confounded.

The length of time to be spent reading the strategies and the number of moves in the strategies were roughly the same as those observed in the high schools in our sample in our previous research (Smith et al., op. cit.) i.e. about four minutes and 6 to 8 moves per strategy. The difficulty level in the strategies in this experiment was judged to be about the same as observed in the sample in our previous work (ibid.).

We decided that we could not control for a large number of variables in the strategies that could influence the outcomes, e.g., length of strategies in terms of number of words, amount of time per word available, the number and intensity of emotionally loaded words, the number of "basic ideas," the number of bits of information, etc.[2] We did decide to keep the Core in all the strategies, so at least this passage would be a constant in the strategies, and just add extra moves.

With respect to the authenticity of content, nothing was fictitious. We included only known factual material in Description moves. The actual positions of accepted authorities were used in the Citing Authority moves.

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[2] In fact, it may be impossible in principle to "control all variables but the independent variables" in verbal passages of any interesting length.

The analogies in the Analogy moves were all from literature about EC topics (except one about drugs which is a basically similar problem). The Criterion moves contained specific criteria that many people would find reasonable (to our knowledge, no official or agreed-upon criteria exist for the EC problem), having to do with harmfulness, wastefulness, and violation of rights.

The four strategies for each of the two topics are contained in Appendix III.

Construction of Multiple-Choice and Free-Response Tests

The general objective in constructing the multiple-choice (MC) and free-response (FR) tests was to discriminate among the strategies. However, a few items were devised on which we expected no differences, just to see if there were retention differences among the groups.

The tests had the following features.

(1) The tests for Fl and Pst were made comparable, item by item. For example, the first item in the Fl FR part was "What do you feel is the most telling point against fluoridation?" and the first item in the Pst FR part was "What do you feel is the most telling point against the use of pesticides?"

(2) The tests were designed to assess a variety of outcomes - retention (e.g. items 2 in FR and 3 in MC), comprehension (e.g., items 4 in FR and 1 in MC), and transfer, both within (e.g., items 9 in FR) and outside (Part III) of EC problems. The MC items outside EC problems were all in Part III, all focussed on an imaginary situation about infant learning.

(3) The FR part preceded the MC part for each EC topic, in order to minimize possible learning effects from MC alternatives.

Format. The items and pages in the FR part were not numbered, so as to reduce possible confusion arising from the pages being in differeng orders (from counterbalancing item order). The item order in FR was counterbalanced to be sure of getting data on all items.

Time limits. The time limits were 7 minutes for Part I (Fl, FR), 5 minutes for Part II (Fl, MC), 5 minutes for Part III (Infant learning, MC), 7 minutes for Part IV (Pst. FR), and 5 minutes for Part V (Pst. MC).

The MC and FR tests are contained in Appendices V and VI, respectively.

Construction of Semantic Differential

Two standard scales were selected for each of the Evaluative, Potency, and Activity dimensions of the semantic differential (SD): good-bad and nice-awful for the Evaluative dimension, strong-weak and big-little for the Potency dimension, and fast-slow and hot-cold for the Activity dimension (Osgood et al., op. cit.).

Two additional scales were used for the Evaluative dimension, both to get a better measure of attitude change by having four scales on this dimension (the Evaluative dimension is claimed to be a measure of attitude (ibid.)) and to get scales denotatively more specific and appropriate to the two EC concepts (the latter to see if there would be a difference among the Evaluative scales that might be attributable to denotation).

The format used here placed one EC concept and the eight scales on each page, with a separate page for each concept. The order of the scales was the same for both EC concepts, the scales being ordered so that no two standard scales for the same dimension would be adjacent.

The post-strategy order and polarity of the scales for each concept was different than the pre-strategy order. This was done in an attempt to minimize memory effects. (As in the pre-strategy order, the post-strategy order of the scales was arranged so that no two of the standard scales for the same dimension would be adjacent.)

The instructions were a slightly modified version of the standard instructions (ibid.).

The SD is contained in Appendix IV.

Research Design

A total of 303 11th grade students from two high schools in the Salt Lake School District were used as Ss for the present investigation. Approximately one half of the Ss (150) from each school were randomly assigned to one of two orders of presentation with the remaining half given the second order (Fl-Pst or Pst-Fl). Order of items was partially counterbalanced within each subgroup, with half of Ss in one subgroup receiving one order of item presentation while the remaining Ss were given the second order.

Within each order effect, Ss were further divided into four subgroups (approximately 40 Ss per subgroup) and assigned to receive one of the four strategies: Core; Core plus Authority; Core plus Analogy; and Core plus Criterion. (There were 8 subgroups in all.)

The design is a 2 (schools) x 2 (topic order: Fl-Pst, Pst-Fl) x 4 (strategies: Core; Core plus Authority; Core plus Analogy; Core plus Criterion).

Table 1 shows the design of the experiment executed by the differences in content and order of materials in the test booklet. For example, subgroup 1 (Row 1) composed of 40 Ss (20 from each school) was given a test

booklet containing prestrategy semantic differentials, Core passages for use of pesticides and then fluoridation, poststrategy semantic differentials, free-response questions pertaining to pesticides, multiple-choice questions pertaining to pesticides, multiple-choice questions used to measure transfer to a different (non-EC) situation, free-response questions for fluoridation, and multiple-choice questions for fluoridation. The numbers above each column indicate the total number of minutes Ss had to complete each section of the test booklet. Also, the first four subgroups received the fluoridation-pesticides order while the remaining four were administered the reverse order. The horizontal lines within a row indicates a further subdivision of the subgroups.

Table 1

Design of Experiment

minutes	Pre In SD		Passages		Post SD		Free Response	MC	MC	Free Response	MC
	F	P	F	P	F	P	F	F	T	P	P
Schools	5	1	4	4	1	1	7	5	5	7	5
A B			Core	Core			1,2,3*			1,2,3*	
A B			Core + Authority	Core + Authority			1,2,3			1,2,3	
A B			Core + Analogy	Core + Analogy			1,2,3			1,2,3	
A B			Core + Criteria	Core + Criteria			1,2,3			1,2,3	
	P	F	P	F	P	F	P	P	T	F	F
A B			Core	Core			2,3,1			2,3,1	
A B			Core + Authority	Core + Authority			2,3,1			2,3,1	
A B			Core + Analogy	Core + Analogy			2,3,1			2,3,1	
A B			Core + Criteria	Core + Criteria			2,3,1			2,3,1	

List of Abbreviations:

In = Introduction
SD = Semantic Differential
F = Fluoridation
P = Pesticides
MC = Multiple Choice
T = Transfer

*The numbers in the cells correspond to the pages in Appendix VI for the appropriate topic. For example, the number 1 under fluoridation indicates the first page of fluoridation items in Appendix VI, the number 2 under fluoridation indicates the second page of fluoridation items in Appendix VI, the number 3 under pesticides indicates the third page of pesticide items in Appendix VI, etc.

Chapter II

Results

Several factors were important in deciding that a sophisticated analysis would not be required or even justified at this stage of our experimentation: the exploratory nature of our study, the time available, missing data, and conceptual difficulties in the meaning of a total score.

This is the first study in the context of our venture-move system of analysis (Smith et al., op. cit.) that investigates the effects of <u>evaluative</u> teaching strategies (as opposed, e.g., to conceptual strategies (Nuthall, 1966)). Since it is the first study, we have a number of uncontrolled variables (both known and unknown) in our strategies, so that we are unable to draw conclusions about the effects of the moves per se. Also, our tests are at a rather unsophisticated level of development.

Since we had no time for adequate pilot studies, we underestimated how much data would be missing. There were many omitted items (about 20%) scattered throughout the completed items, in addition to the omitted items at the end of each part of the test. These omitted items would greatly increase the difficulty and the time required for a generalizability and rigorous multivariate analysis (which would require essentially no missing data).

There were conceptual difficulties involved in trying to assign a meaningful total score to both the MC and the FR parts of the test. These conceptual difficulties arise mostly because of the variety of tasks involved in assessing the variety of effects of an evaluative teaching strategy; thus one cannot easily assume a homogeneous test. Also, it is

difficult to construct items to measure the desired variety of outcomes, all of which can be scored right or wrong - this is true whether we are considering MC or FR items.

Our procedure will be essentially to describe briefly the results only for items (and scales for the SD) on which important differences among the strategies were found. Occasionally, important differences among strategies for topics and schools are reported. No important item order effects were found. However, we shall not present data on items for which no significant[3] differences among strategies were found.

Multiple-Choice Items

Most of the MC items can be scored right or wrong. However, this is not the case with all of the items. For example, in the analogy items (number 4 in each of the three MC parts) the conditions described in the alternatives are similar in somewhat different ways to fluoridation or pesticides or infant learning. Another item, item 2 in the F1 part, turned out after closer examination to have two correct alternatives. Another item, item 1 in each of the three MC parts, does not test for anything directly in the strategy, so we would not expect differences among the strategies on this item. (The item was put in mostly to assess a minimal level of understanding on the student's part of what a value judgment was. However, it turned out that there is some difficulty involved in interpreting this item, since there is a possibility of confusion as to what the item meant.) Thus, no total score was computed for the MC parts of the test.

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[3]Criteria for significance were judgmental rather purely statistical in order to emphasize practical differences.

Three items on the Pst part (2, 3, and 5) turned out to be too easy, so that little discrimination among the strategies was obtained on these items.

The most significant results for both the F1 and Pst parts seemed to appear on items 6. These results are presented in Table 2, in which the order of the strategies along the horizontal dimension of the table corresponds to the degree of support for the rating in the strategy. Thus the Core strategy had the least amount of support, the Citing Authority strategy had the next most amount of support, the Analogy strategy the next most amount of support, and the Criterion strategy the most amount of support. The results indicate that the Criterion group was somewhat better at identifying or selecting reasons against fluoridation or use of pesticides.

Part III. No important differences among strategies were found on any of the items 2-6. Since Part III was designed to test for transfer, either the infant learning situation described in the test was too remote from that in the strategies, or the processes of evaluation were somewhat different than involved in EC topics. Perhaps a better test of transfer in the early stages of experimentation would involve other EC problems.

Free-Response Items

We found it necessary to construct a coding system for the wide variety of responses found on each item. We constructed the coding system so that it would be general over all items. Thus we could compare the four strategies item by item with respect to frequency of responses in the various categories, using the same system for all items.

We had no apparent or explicitly developed preconceptions as to the kind of categories that should be in the coding system -- even with respect to

Table 2

Frequency of Responses in the Multiple-Choice Items 6

for the Four Strategies

Fluoridation					Pesticides				
Alternative	Core	Auth	Anal	Crit	Alternative	Core	Auth	Anal	Crit
a	13	11	14	5	a	5	3	5	2
b	20	20	11	7	b	3	5	0	3
c	10	8	16	7	c	54	53	52	33
d*	31	30	24	45	d*	11	12	12	31
Total	74	69	65	64	Total	73	73	69	69

*Correct alternative

Item: Which of the following provides the best reason for <u>not</u> having fluoridation?

a) Fluoridation causes a great deal of controversy.
b) Several groups affiliated with medicine have stated their opposition to fluoridation.
c) In the past, substances added to foods have proved harmful.
d) Recent research demonstrates that fluoridation can cause physical illness.

*Correct alternative

Item: The best reason for NOT using pesticides is that

a) using pesticides is inadvisable
b) some noted scientists are against it
c) like other poisons, it may be dangerous
d) it has produced some serious illnesses in man

such things as harmful, effective, safe, etc., factors which were either stressed or mentioned in the strategy.

As the first step in developing an adequate coding system for the FR questions, responses to eight items (four Fl and four Pst) were sampled for all 303 Ss. The categories were formulated around the central point in each of the responses, e.g., harmful, effective, etc. In an attempt to capture the full meaning of the responses, some of the main categories were divided further into subcategories on the basis of the specific form (syntax) given by Ss, i.e. those of statements (e.g., "It is harmful."), questions ("Is it harmful?"), conditionals ("If it is harmful, then I would not use fluorides."), possibility ("It might (could) be harmful."), and responses implying any given main category (e.g., "It seeps into the underground water system." --- implying harmfulness without actual mention).

Additional categories were devised as the remaining responses were analyzed, although it was not necessary to develop subcategories for some of these as we did with those mentioned above.

A total of sixteen categories were formulated: harmful, effectiveness, costliness or wastefulness, liberty of the people, control or limit, approval by authority, more harm than good, more good than harm, necessary, decision other than yes-no, unqualified acceptance or rejection, inappropriate responses, inadvisability, good and bad points, gives information, and aesthetic. The complete coding system is contained in Appendix VIII.

Since many Ss gave specific reasons to support the central point of their response (e.g., "I would not use fluoridation because it is harmful to the body"), we felt that it would be fruitful to formulate a different subcategory system for these specific reasons given. For example, if a

response stated that fluoridation is harmful because it causes cancer, the first half of the sentence (fluoridation is harmful) would be classified in the Harmful category, with the specific reason (causes cancer) under the harmfulness to people subcategory. However, because nothing systematic was found in these reasons, the results are not reported here.

Reliability of coding system. In order to assess the reliability of the coding system, in the sense of agreement among independent judges, we had three judges categorize responses on the following four items.

1. As indicated in the passage you read on fluoridation, the president of the National Health Federation and the Royal Medical Board of Sweden are opposed to fluoridation. On the other hand, the American Dental Association and the American Medical Association are in favor of fluoridation.
a) How would you decide between these opposing groups?

2. What is the most important information to consider in deciding whether or not to adopt fluoridation in a community?

3. Suppose that your view is that we should adopt a helpful practice unless there is some good reason to believe that it might produce a serious disease in humans. With this view, what would you decide about the advisability of using pesticides on farm crops? Why?

4. What do you feel is the most telling point against the use of pesticides?

These items were selected to maximize the variety of responses with two items for fluoridation and two for pesticides. A stratified random sample of 64 Ss was selected, the strata being the strategies, schools, and orders.

Three judges independently categorized the responses of the 64 Ss on the four items. The classification of responses on each item were then compared for agreement within the subcategories. The overall agreement was substantially high, over 80%[4]. Of the 208 responses (there were 48 missing responses for the 64 Ss) there were 18 responses (9%) on which all three

[4]However, since the three judges had also developed the category system, these results probably overestimate the agreement that would be obtained among other users of the coding system. On the other hand, the figure is for subcategory agreement, which is a stringent requirement.

judges disagreed and 38 responses (18%) on which one judge disagreed. Thus a total of 56 responses (27%) had at least one judge disagreeing. (But of course with two of three judges agreeing, as in the 18%, this is fairly good agreement.) Furthermore, of these 56 disagreements, all but one were immediately removed after a brief discussion among the judges revealed slight oversights and omissions.

Results of Coding System analysis.

The first kind of analysis of interest is that in which the total number of "negative"[5] responses in all sixteen of the categories is obtained. (Here "negative" refers to a response reflecting a negative rating of the topic, e.g. "It is harmful" and "It is not effective".)

When these total frequencies for the "negative" responses are converted to percentages and plotted as a function of degree of support, results are obtained as in Figure 1. (The positive response function is just the inverse of this, of course, so is not shown.)

For Fluoridation, the four strategy groups show more differences than they do on Pesticides, but both topics show clear differences among the strategies. There is no difference between the two strategies with intermediate degrees of support for both topics.

For Fluoridation, the Core strategy had essentially the same effects as the Citing Authority and Analogy strategies, so that the Criterion and associated Description moves in the Criterion strategy resulted in substantially more negative reactions to fluoridation.

For Pesticides, on the other hand, the Criterion strategy had essentially the same effects as the Citing Authority and Analogy strategies, indicating

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[5]Other than in the analysis of these total responses, a negative response is one which negates the category, e.g. "It is not harmful" or "It is not effective.". Examples of other negative responses are given with their appropriate categories in Appendix VIII.

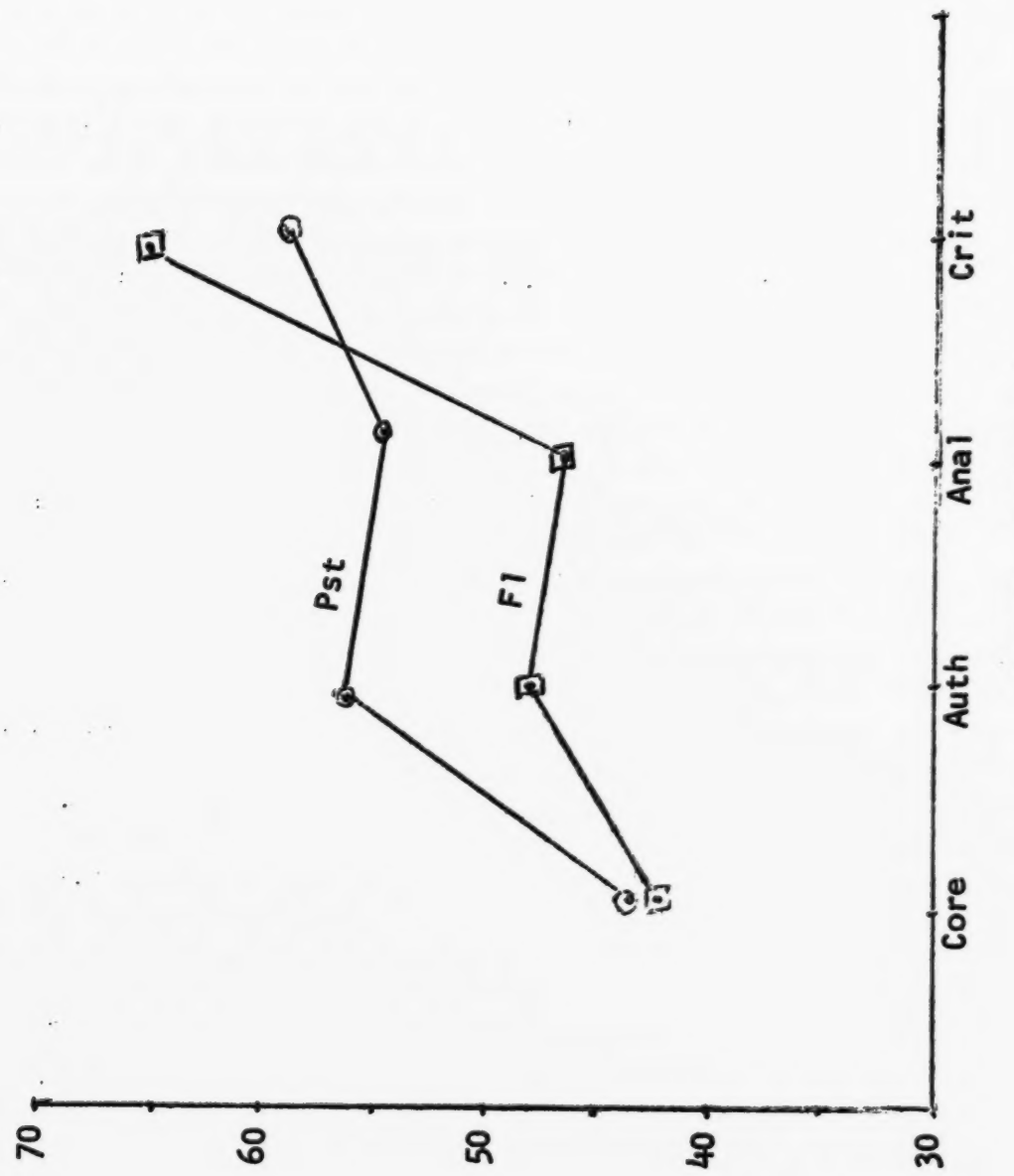

Figure 1. Per Cent of Negative Responses over All Categories as a Function of Degree of Support.

that any negative information about pesticides over and above the Core passage resulted in more negative reactions to the use of pesticides.

In the second kind of analysis we were more specific, and focused on the Harmful and Effectiveness categories. Separating positive and negative responses (now again in the sense of positive and negative within the category), and computing separately the responses in subcategory e of the Harmful category (subcategory e reflects statements implying but not explicitly stating harmfulness), and converting frequencies to percentages, we obtain results as shown in Figure 2, in which the five curves show percentage of response as a function of degree of support.

For Fluoridation, the Criterion group had more positive Harmful responses (e.g. "Fluoridation is harmful") than the other three groups (also more of the positive Harmful responses plus implied Harmful responses.) The Criterion group also had fewer positive Effectiveness responses (e.g. "Fluoridation is effective") than the other groups. There were essentially no differences among the other three groups. Thus the Criterion strategy tended to produce more negative reaction to fluoridation than the other strategies, both in increasing the likelihood of thinking it harmful and in decreasing the likelihood of thinking it effective (two very distinct matters).

For Pesticides, on the other hand, there were essentially no differences among the four groups, except that the Core group had slightly more negative Harmful responses (e.g. "Pesticides are not harmful") than the other three groups. These results may be interpreted essentially the same as those for the total negative responses, i.e. that any "negative" information beyond the Core strategy impressed the subjects with the harmfulness of pesticides. Perhaps this is because of the nature of the topic - pesticides are known to

be powerful poisons, so that potential dangers are more apparent.

An item-by-item analysis disclosed that very few items showed clear differences among the strategy groups. For Fluoridation, only on items one (What do you feel is the most telling point against fluoridation?) and five (What is the most important information...?) were clear differences among the groups obtained, the Criterion group giving more positive Harmful responses than the other groups.

For Pesticides, only on items four (What was the main point of the passage on the use of pesticides?), five (What is the most important point . . .?), and seven (Suppose your view. . .advisability of using pesticides on farm crops? Why?) were clear differences obtained. On item four, both the Authority and Analogy groups gave more positive Harmful responses than the Core and Criterion groups. On item five, the Analogy group gave more positive Harmful responses than the other groups. And on item seven, the Authority group gave fewer positive Harmful responses than the other groups.

Although the results for the two Fl items tend to correspond to the conclusions about the total negative responses and those for only the Harmful and Effectiveness categories, this is not true of the Pst items. We are unable to explain these results, but will attempt to take them into account in future test construction.

Key:

▲ — · — · — · ▲	H+ with e	(Positive Harmful Responses with Implied Harmful)
□ ———— □	H+ - e	(Positive Harmful Responses without Implied Harmful)
□ - - - - - □	H-	(Negative Harmful Responses)
○ ———— ○	E+	(Positive Effectiveness Responses)
○ - - - - - ○	E-	(Negative Effectiveness Responses)

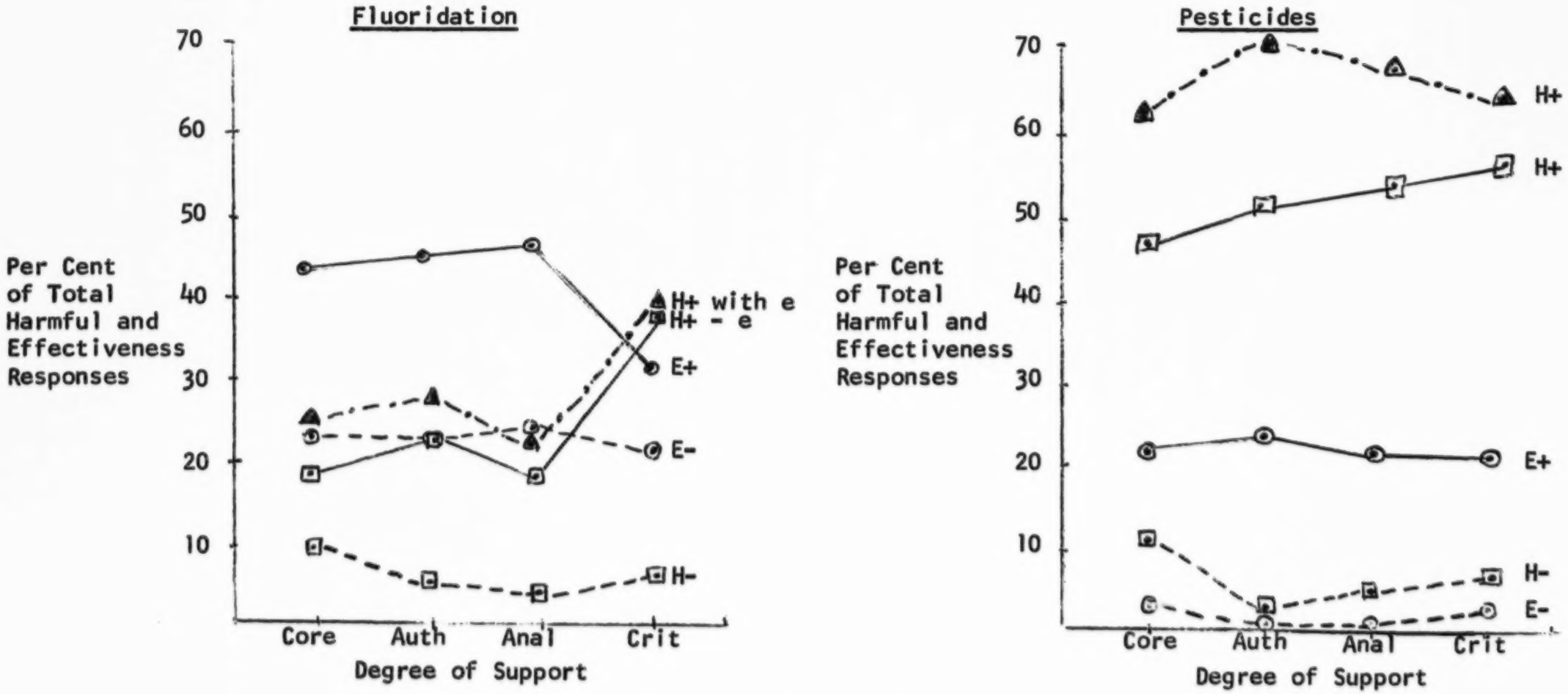

Figure 2. Per Cent of Total Responses for Only Harmful plus Effectiveness Categories as a Function of Degree of Support.

Semantic Differential

There was a fair amount of confusion and even some hostility on the part of some Ss toward the semantic differential task. In spite of this, however, as will be seen, the results obtained on the semantic differential were fairly close to our preliminary expectations. Perhaps, then, this confusion and hostility did not significantly distort the results.

We had expected differences (between pre- and post- strategy scores) among the groups to show up in changes on some scales and not on other scales. For this reason, we did not compute a total difference score between pre-strategy and post-strategy scores across all scales. Rather, we analyzed the difference scores scale by scale.

For our purposes, a rather crude analysis is sufficient on each scale. As a rule of thumb, we considered any change above +1.00 as significant. For our purposes, this judgmentally-based rough rule takes sufficient account of regression effects and unreliability.

We examined the changes in two ways. One was the number of significant changes and the other the direction and magnitude of the changes.

A. Number of Significant Changes

The number of changes on each scale was determined, there being 8 possible changes for each group (two topics, two orders, two schools). Table 3 presents the results of this analysis.

The first point to note is that for every scale, the Criterion group shows as many or more changes than any other group.

Second, the only important differences among the four groups are on the Evaluative scales, the Potency and Activity dimensions showing essentially no important differences.

Table 3

Number of Significant Changes on the Semantic Differential Scales

Scale	Strategy			
	Core	Auth	Anal	Crit
Evaluative				
Good - bad	3	2	2	5
Nice - awful	0	0	0	2
Safe - harmful	1	1	1	5
Successful - unsuccessful	2	0	1	6
Potency				
Strong - weak	1	0	0	2
Big - little	2	0	2	2
Activity				
Fast - slow	0	0	1	1
Hot - cold	1	0	0	1
Total	10	3	7	23

Third, on the Evaluative dimension the smallest difference among the groups is on the nice - awful scale with only a slightly greater difference among the groups on this scale than on scales from the Potency and Activity dimensions. The good - bad scale shows only slightly greater differences among the groups but the total number of changes on the scale over all groups is greater than for the scales on the Potency and Activity dimensions.

Fourth, the most important differences among the groups occur on the two scales which are denotatively most relevant to the EC topics, safe - harmful and successful - unsuccessful.[6] These results indicate that the Criterion group responds more negatively to the strategies, and is consistent with the results in the FR parts of the test.

B. Direction and Magnitude of Change

A more detailed analysis of the results on the Evaluative scales was made, including the direction and magnitude of change, topic, school, and topic order. The results comparing the groups are presented in Table 4.[7]

Every change on each scale was in the same direction, toward the "bad" end of the scale in the post-strategy SD. (Thus the direction of change is not indicated in Table 4.) This is significant in indicating that although the changes were small they were not of a chance nature.

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[6] They are also more specific to the language used in the strategies, which may produce a spuriously larger difference than the other Evaluative scales.

[7] No differences between the two schools were found. Some differences due to topic order resulted, and would bear watching in replications. However, note that no topic order differences were found for the MC and FR items.

Table 4

Magnitude of Change on the Semantic Differential Evaluative Scales

Scale	Core F	Core P	Strategy and Topic Auth F	Auth P	Anal F	Anal P	Crit F	Crit P
Good - bad	1.6	1.3, 1.6		1.5, 2.2	1.2	2.2	1.3	1.5, 1.8, 2.1, 2.2
Nice - awful							1.5	1.4
Safe - harmful	2.0			1.2	1.0		1.3, 1.8, 2.2	1.5, 1.6
Successful - unsuccessful	1.0, 1.4					1.8	1.2, 1.4	1.5, 1.9, 2.0, 3.0

The differences in the magnitude of the changes are somewhat difficult to interpret, since the number of changes is so small in the Core, Authority, and Analogy groups. However, there do seem to be more changes in the Pesticide topic, with the magnitude of change slightly greater for Pesticides than Fluoridation. And the magnitude of change on Pesticides in the Criterion group for the successful - unsuccessful scale seems slightly higher than for the other scales (for Pesticides).

Chapter III

Conclusions

For this exploratory study, we feel that, although a number of interesting hypotheses are suggested by our data, only the following conclusions are warranted. (These are stated in terms of the groups, rather than degree of support, because of the number of uncontrolled variables that could be influencing the outcomes.)

In general, there is a relatively consistent pattern of differences on our outcome measures among the Core, Analogy, Authority, and Criterion groups.

The Criterion group reacted negatively fo fluoridation and the use of pesticides as much or more than the other three groups. And the Core group reacted negatively to fluoridation and the use of pesticides as little as or less than the other three groups.

Differences among the groups depended on the topic. The Criterion group reacted more negatively to fluoridation than the other three groups, with a higher proportion of subjects saying that fluoridation is harmful and a lower proportion of subjects saying that fluoridation is effective. The Criterion group reacted more negatively to the use of pesticides than the other three groups in some respects but not others. For example, a higher proportion of subjects in the Criterion group give better reasons (that serious illnesses in man are produced) for not using pesticides and show greater change in their attitude toward the use of pesticides. However, for some reason not clear from our data, the four groups show essentially no differences in the proportion of harmful or effective kinds of responses on our Free-Response items, either singly or as a whole.

Finally, all subjects show more concern with the harmfulness and effectiveness of the two EC topics than with any other features or issues (such as wastefulness and rights). The groups generally show more concern with effectiveness than harmfulness of fluoridation, and more concern with harmfulness than effectiveness of pesticides. (One exception was the Criterion group showing equal concern for harmfulness and effectiveness of fluoridation.)

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APPENDIX I

Moves in Evaluative Ventures

Attachment a1

MOVES IN EVALUATION VENTURES

1. Identification Moves

   1.1 Identification of Value Object and/or Value Term. Either the value object, or the value term, or both, are named or identified. In the case of the value object being a report or action, it may be given or performed.

2. Description Moves

   2.1 Explication of Value Object

      2.11 Description. A description of the attributes, properties, etc., of the value object. When the value object is an argument or proposition, this may include discussion of the premises, assumptions, or evidence on which the argument is based.

      2.12 Classification. The value object is identified as a member of some more general descriptive (not normative) class of things.

      2.13 Subsidiary Rating. The value object is given some rating which is different from (i.e., involves a different value term) from the rating which forms the main point of the discusson.

      2.14 Instance Comparison. Instances of the value object are compared in order to illustrate or demonstrate some characteristic of the value object.

   2.2 Identification of Relational Properties

      2.21 Consequences. A description of the consequences, products, actions, outcomes, etc., of the value object.

      2.22 Origins. A description or duscussion of the antecedents, origins, causes or reasons for the value object.

   2.3 Instance Description. An instance, or subclass or the value object is named or described. Characteristics, origins, consequences, etc., may be mentioned.

3. Rating Moves

   3.1 Rating of the Value Object. The value object which forms the center of the discussion is rated as to its value.

   3.2 Rating of Characteristics. Some characteristic or relational

property (consequence or origin) of the value object is rated as to its value.

3.3 Instance Evaluation. Some instance, or subclass of the value object is rated as to its value. The instance may be either real or hypothetical.

4. Criteria Moves

4.1 Explication of Value Term. A description or discussion of the evaluative force, or meaning of the value term.

4.2 Citing Criteria. A standard or rule, or some set of alternative standards or rules, by which a rating of the value object can be made, are stated or discussed. There may, or may not be discussion of the relative importance of alternative standards or rules.

4.3 Substantiation of Criteria. Evidence or reasons for or against some rule or standard for rating the value object, are given or discussed.

4.4 Irrelevance of Value Term. The irrelevance of the value term, or some or all of the criteria for the value term, is asserted or discussed. Or it is asserted that the value term cannot be applied because of the lack of appropriate evidence.

5. Relational Moves

5.1 Explanation of Discordant Characteristics. Evidence or explanation is given to indicate why some characteristic of the value object which is apparently discordant with a previous rating, should be discounted or ignored.

5.2 Citing an Alternative Value Object. An object, practice, reason, etc., having a value rating different from the value object under consideration is cited or discussed. This alternative value object may be real or hypothetical.

5.3 Citing an Authority. The opinion or conclusions of some authority such as a public figure or textbook writer are cited as evidence for or against a rating of the value object. Any discussion of the credibility, or expertness of such an authority, is also included in this move.

5.4 Implication. A rating is supported on the grounds that it does not have the same characteristics or effects as other objects which have an opposite rating.

5.5 Analogy. The value object is likened to another object customarily believed to be either good or bad, or widely practiced. Evidence may or may not be given to support the analogy.

6. Tangential Evidence

6.1 Facts, beliefs, etc., which are relevant to the value object, but not directly relevant to the rating of the object, are cited or discussed. (Also included in this category are moves in which a value object, other than the one which is central to the discussion, is rated, apparently because of misunderstanding,

EVALUATION VENTURES

Definitions

1. Value Object. The value object may be an object, action, practice, belief, argument, proposition, law, report, reason, etc. It may be a class of things or a particular thing. There is normally only one value object which forms the center of the discussion in an evaluation venture.

2. Rating. The term "rating" is used to indicate the application of some value judgment to a value object. It usually consists of applying a value term to a value object, but occasionally it consists of deciding that a value object is better or worse than some other value object.

3. Value Term. A value term is any term which clearly implies approval or desirableness (or disapproval or undesirableness). Common value terms are: good, moral, just, desirable, (morally) right, fair, reliable, honest, upright (and their opposites). Within appropriate contexts, words like democratic, strong, equal, balanced, legal, emotional, strange (and their opposites) can also be clearly value terms. Normally, there is only one value term which is central to the discussion in an evaluation venture, although occasionally synonyms of a value term are introduced.

4. Criteria. The criteria for a value term are the rules or standards which specify when the term can be applied correctly. For instance, it might be agreed that a "good" car is a car which satisfies the transportation needs of its owner. In this case "satisfies the transportation needs of its owner" is the criterion which must be met if the term "good" is to be applied correctly to a particular car. Sometimes the criteria may be a set of conditions which permit the use of the value term, but do not necessarily indicate that it is being used correctly. For instance, we may agree that "moral" is a term which "can be applied only to consciously chosen acts." This tells us something about what we mean by "moral," but it does not tell us exactly when we can use it correctly.

EXAMPLES

1. Identification Moves

"Do you think that President Jackson was a strong president?"

"Do you think you would call this a just law?

"Well, what do you think of the author's reasoning here?" (Value term not introduced until later in venture)

2. Description Moves

"The law required that a person convicted of murder be sentenced to death." (2.11)

"The author's reasoning here is a case of reductio ad absurdum." (2.12)

"President Jackson was certainly effective in dealing with Congress." (Where the point of the venture is whether President Jackson was a strong president) (2.13)

"The law had the effect of reducing the number of murders committed." (2.21)

"The law was originally enacted by a decree of the president." (2.22)

"In the case of cleaning one's teeth every morning it is a habit which results in good health." (2.3)

3. Rating Moves

"I think it's just." (3.1)

"I don't think it was as fair then as it is today." (3.1)

"The effect of that law on the working classes was mostly bad." (3.2)

"I don't know whether the author's reasoning is valid or not, but the emotional words he uses have a bad effect." (3.2)

"So you would say that cleaning one's teeth every morning was a good thing." (In a discussion of whether habits are good.) (3.3)

4. Criteria Moves

"I think the word 'immoral' is too strong a word to use in these circumstances." (4.1)

"I suppose a just law is one in which the punishment is appropriate for the crime committed." (4.2)

"But doesn't strong president mean that he got the things he wanted carried through Congress?" (4.2)

"But you don't necessarily mean by a just law that it was enacted by a democratic institution. You could mean . . . etc." (4.3)

"You can't say whether making parents pay for the crimes of juvenile delinquents would be a good deterrent, because we don't know what the effects would be." (4.4)

"You can't really say whether this law is just or not. It all depends on how it is interpreted by the courts." (4.4)

5. Relational Moves

"I still think he was a fair man. In that particular case he was only unfair because he didn't have all the necessary information." (5.1)

"He may have made one or two mistakes -- everyone does -- but on the whole, he was an honest man." (5.1)

"If the author had taken all of the evidence into account and come to the opposite conclusion, you could have called his reasoning valid." (5.2)

"Now if you consider the murder laws in the State of ----, those are what you would call just laws." (5.2)

"You may think otherwise, but the chemistry teacher thinks biology is a waste of time." (5.3)

"You can't believe what the chemistry teacher says. He's got his own ax to grind." (5.3)

"That report must have been fair, because if it wasn't there would have been a libel case by now." (5.4)

"The author's reasoning must be valid, otherwise why would so many people believe him." (5.4)

"That law is just like the murder laws we have in this country." (5.5)

"What he did was the same thing as anyone else would have done in the circumstances." (Where it is implied that what "anyone else would have done" is desirable or commendable.) (5.5)

APPENDIX II

General Instructions

INSTRUCTIONS

This study does not involve either an intelligence or a personality test. We are simply trying to determine how people react to certain kinds of written material.

You will read two passages, each about a topic of a controversial nature. Both the topics and the passages are similar to discussions which you might encounter in a typical social studies classroom.

The booklet you have contains the two passages and some appropriate questions on each passage. First you will read the passages. After completing the second passage you will answer questions on the topics covered in the two passages. The questions are of two general types: "essay" and multiple-choice.

Are there any questions?

[Actually, before you read the passages we'd like to have you take an interesting little test to see how you react to two topics.

Let's turn the page and look at the test.]*

*Material in brackets was read to the subjects, and did not appear in their instructions.

APPENDIX III

Core, Citing Authority, Analogy, and Criterion Strategies for Fluoridation and Use of Pesticides

Appendix III

Passages Containing Moves for the Four Strategies for Fluoridation and Use of Pesticides

First and second pages:	Core moves, Fluoridation
Third page:	Citing Authority moves, Fluoridation
Fourth page:	Analogy moves, Fluoridation
Fifth page:	Criterion moves, Fluoridation
Sixth and seventh pages:	Core moves, Pesticides
Eighth page:	Citing Authority moves, Pesticides
Ninth page:	Analogy moves, Pesticides
Tenth page:	Criterion moves, Pesticides

FLUORIDATION

Many times during the year controversial issues arise and citizens must take a position with respect to these issues. In recent years people have had to make decisions concerning many policies, prominent among them are civil rights, federal aid to education and the war in Viet Nam. Another such issue has to do with fluoridating the public water supply. We shall discuss this issue in this passage.

As you may know, fluoridation involves placing a specified amount of sodium fluoride in the public water supply. The ratio of fluoride to water has been set at 1 part sodium fluoride per 1 million parts water. There are 3 major reasons why fluoridation has been suggested as a health measure to attempt to control tooth decay. First, although results are not at all conclusive, it seems that fluoridation has met with some success in reducing tooth decay. Second, the supply of dentists is expected to be critically low within the next few years. Third, the problem is widespread since tooth decay is the most prevalent health problem known to man.

To initiate the practice of fluoridation, at this time, however, is inadvisable.

There is a problem in maintaining the set ratio of fluoride to water since different people consume different amounts of water during the course of a day. Furthermore, when water is boiled, the ratio of fluoride to water increases, because water evaporates but fluoride does not.

Some statistics which were gathered in 1965 show that the dentist to population ratio in Washington, D.C., which has had fluoridated water for 12 years, is the highest dentist to population ratio in the country. This fact shows that fluoridation may not solve the problems concerning the shortage of dentists as was claimed.

When we begin to look into this issue more closely, several things begin to crystallize. First of all, it is claimed that fluoridation helps reduce tooth decay by as much as 60% in some communities. What does this mean? Well, we can't include adults in this 60% since fluoride does not help reduce tooth decay in adults to any significant degree. It really only helps those 16 and under. Furthermore, fluoridation does not help people from ages 10-16 as much as those 10 and under. So the only ones fluoridation really helps are children from 1-10 years old. Now, children from 1-10 represent only a very small percentage of the total people in the United States. So, what we would be doing if we allowed fluoridation to be used would be making everyone take fluoride when only a very small percentage would be actually helped. Other alternatives may be possible to help just this small percentage.

Finally, the fluoridation issue has become emotionally tinged to the point that it has not received the unbiased attention in medical circles that a new health measure should receive.

There are many authorities who oppose fluoridation. For example several years ago the Royal Medical Board of Sweden voted in favor of prohibiting any and all fluorides from being added to public water supplies.

Other authorities opposing fluoridation are the President of the National Health Federation, and Dr. Albert Burgstaher, Professor of Chemistry at the University of Kansas.

Other factors are important in considering fluoridation. We all know about drugs that were developed to help people and turned out not to, such as thalidomide and the deformed babies it produced. Substances have also been added to our food supply that turned out to be harmful. For example, Agene, a bleaching substance added to make flour white, was used for 25 years before it was shown to produce running fits in dogs. Then it was made illegal to use Agene.

If we look at fluoridation as giving people a substance to prevent a disease, tooth decay, then it is like compulsory medication, and compulsory medication violates our rights to choose our own medication.

Actually there aren't any clear standards or criteria for evaluating fluoridation. But we can consider three factors: harmfulness, wastefulness, and violation of rights.

Regarding harmfulness, we might consider as excessively harmful any practice which is shown to produce a serious disease. Recent research has shown clearly that fluoridated water - at the same concentration as used in our community water supplies - produces cancer in mice and also shortens their lives by about 10%. Recent evidence also indicates that fluoridation results in migraine, epigastric distress, spastic colitis, and arthritic pain, especially in the lower back.

Regarding wastefulness, it seems clear that we would like no more than half of a product to be wasted. But with fluoridation, most of the fluoridated water is wasted, because 99% of it is used for various industrial activities, watering lawns, taking showers, doing dishes, etc.

Regarding violation of rights, we Americans feel that any form of compulsory medication is inadvisable unless it is absolutely necessary for our health (like chlorination of the water supply). So if we look at fluoridation as a way of combatting disease it is a form of medication, and all people are being forced to take it, whether it supposedly benefits them or not.

PESTICIDES

Many times during the year controversial issues arise and citizens must take a position with respect to these issues. In recent years people have had to make decisions concerning many policies, prominent among them are civil rights, federal aid to education and the war in Viet Nam. Another such issue has to do with the use of pesticides. We shall discuss this issue in this passage.

As you probably know, using pesticides involves spraying or otherwise administering some chemical to farmers' crops. There are two major reasons why the use of pesticides has been suggested as a means of combatting the destruction of farmers' crops by insects. First, although results are not at all conclusive, it seems that using pesticides has met with some success. Second, the problem is widespread since insects attack crops regardless of area.

The practice of using pesticides, however, is inadvisable.

There is always a problem in administering pesticides to crops. For instance, the amount of pesticide used cannot be controlled when large-scale spraying operations are used, particularly where the use of airplanes is involved.

Another problem derives from the fact that when pesticides are used repeatedly, the ground becomes saturated with the chemicals and there is no effective method for removing these chemicals from the soil. For example, pesticides have been found 17 feet deep in one region.

This kind of thing is also true for rivers and lakes, especially our great underground waterways. Some cases have been reported which show that free standing pesticides had worked their way into the underground water systems and appeared as far as 3 miles away in the irrigation water of local farmers.

Another problem is that the free standing chemicals used in pesticides undergo radical transformations due to the action of air, water and sunlight. The results of these transformations are the production of more powerful chemicals which are just left standing. There is no effective way to combat this process.

Still another problem is the fact that certain organs of the body seem to store the residues from pesticides.

Finally, the pesticides issue has become emotionally tinged to the point that it has not received the unbiased attention that a measure of this importance should receive.

There are many authorities who oppose present procedures in the use of pesticides. Perhaps the best known is Rachel Carson, the author of Silent Spring, which brought the public's attention to the problem of pesticides. A group which has pointed out the dangers of pesticides is the Greater St. Louis Citizens' Committee for Nuclear Information, a group of scientists which includes well-known physicists, chemists, and biologists.

Finally, legal authorities have shown their opposition to pesticides by passing a law specifying that there be no DDT at all in milk sold to the public.

Other factors are important in considering the use of pesticides. We all know about nuclear fallout from testing of atomic and hydrogen bombs. It wasn't realized just how dangerous it could be. Air pollution and water pollution are the same kinds of problems as pesticides, since the poisons are in the parts of our environment that we need in order to live, that is, air, water, and food. As things now stand there is no way we can escape these things polluting our environment, so we can't help but be affected by them.

Actually there aren't any clear standards or criteria for evaluating the use of pesticides. But we can consider three factors: harmfulness, wastefulness, and ineffectiveness.

Regarding harmfulness, we might consider as excessively harmful any practice which is fatal to man or some desirable animals or birds, or is shown to produce a serious disease in man. Research has shown that pesticide residues have helped cause a certain form of liver disease. One weed-killer, used on cranberries, was shown to cause thyroid cancer in rats. Several workers have died from accidental contact with the powerful insecticides they were spraying on their crops. And many fish and birds have died from application of pesticides.

Regarding wastefulness, it seems clear that we would like no more than half of a product to be wasted. But with the use of pesticides it has been estimated that 95% of the pesticide covers areas where there are no pests, so only 5% gets to the pests.

Regarding ineffectiveness, we want a practice that will actually serve the purpose, that is, eliminate the pests from the crops. But with the pesticides, the insects become immune to each insecticide, so new and more powerful insecticides have to be developed constantly.

APPENDIX IV

Semantic Differential

Semantic Differential Test

In taking this test, please judge the words on the basis of what they mean to you. Each item will require a judgment of a CONCEPT (such as DICTATOR) on a SCALE (such as high-low). You are to rate the concept on each of the 7-point scales indicated.

If you felt that the concept was very closely associated with one end of the scale, you might place your check mark as follows:

DICTATOR:

up____ : ____ : ____ : ____ : ____ : X down.

If you felt that the concept was quite closely related to one side of the scale, you might check as follows:

HOUSE:

straight____ : X : ____ : ____ : ____ : ____ crooked.

If the concept seemed only slightly related to one side as opposed to the other, you might check as follows:

CLOUD:

easy____ : ____ : X : ____ : ____ : ____ difficult.

If you considered the scale completely irrelevant, or both sides equally associated, you would check the middle space on the scale:

TREE:

idealistic____ : ____ : ____ : X : ____ : ____ : ____ realistic.

Each item is different from each other item. Make each item a separate and independent judgment. Work at fairly high speed, without worrying or puzzling over the individual items for long periods. It is your first impressions that we want.

Fluoridation

awful	: : : : : :	nice
big	: : : : : :	little
cold	: : : : : :	hot
good	: : : : : :	bad
harmful	: : : : : :	safe
slow	: : : : : :	fast
successful	: : : : : :	unsuccessful
strong	: : : : : :	weak

Pesticides

awful	: : : : : :	nice
big	: : : : : :	little
cold	: : : : : :	hot
good	: : : : : :	bad
harmful	: : : : : :	safe
slow	: : : : : :	fast
successful	: : : : : :	unsuccessful
strong	: : : : : :	weak

Fluoridation

fast	: : : : : :	slow
safe	: : : : : :	harmful
bad	: : : : : :	good
hot	: : : : : :	cold
little	: : : : : :	big
nice	: : : : : :	awful
successful	: : : : : :	unsuccessful
weak	: : : : : :	strong

Pesticides

fast	: : : : : :	slow
safe	: : : : : :	harmful
bad	: : : : : :	good
hot	: : : : : :	cold
little	: : : : : :	big
nice	: : : : : :	awful
successful	: : : : : :	unsuccessful
weak	: : : : : :	strong

APPENDIX V

Multiple-Choice Items

QUESTIONNAIRE PART II

INSTRUCTIONS

In this second part, you will be asked to mark only the one correct answer in each item.

Example: Assume that the following are facts which are relevant to chlorination (putting chlorine in the public water supply). Which of the facts is most important in helping to decide whether or not chlorination is a useful practice?

a) Chlorination is cheap

(b) Chlorination helps kill dangerous things in the water supply

c) Chlorination is simple to administer

d) Chlorination does not have to be voted on

Again, work carefully, but do not take too long on any one item.

Please do not refer back to Part I.

When you have finished this part, wait until the word is given to start Part III.

Questions 1 - 6 refer to the following paragraph.

Washington, D.C. - Debate continues in the House of Representatives on the issue of fluoridation. Representative Smith (D-Utah) introduced a bill to make mandatory the fluoridation of water supplies in every U.S. community with over 500 people. Much resistance has been directed toward Smith's bill by members of both parties. The opposition believes such legislation is contrary to freedom of choice. Smith claims the legislation is in the best interests of American health.

1. Which of the following statements indicates that something is preferable?

   a) Communities with under 500 people will probably not have fluoridated water supplies.

   b) Communities ought to decide for themselves whether they want fluoridation of their water supplies.

   c) Congress has the responsibility for studying health conditions in the country.

   d) Congress is concerned about maintaining the freedom of choice of citizens.

2. One consequence of fluoridation is that

   a) there are no clear standards for evaluating fluoridation

   b) tooth decay in adults will not decrease significantly

   c) pain in the lower back may result from drinking fluoridated water

   d) government control over matters of health will be decreased

3. Some objective support for <u>not</u> using fluoridation is provided by the

   a) loss of money through waste of fluoride in processing

   b) opposition to fluoridation by the National Health Federation

   c) parent groups who are opposed to fluoridation

   d) manufacturers of toothpastes with fluorides in them

4. Which of the following is most like a situation in which fluoridation produces ill effects in rats?

   a) The inoculation of babies against polio

   b) The use of chlorine to aid in purifying drinking water

   c) The introduction of pasteurization to kill germs in milk.

   d) The destruction of garden plants by pesticide sprays

5. Which of the following provides some support for fluoridation?

   a) People who believe in fluoridation will have their wishes met.

   b) The fluoridation of drinking water seems to reduce tooth decay.

   c) Fluoridation has little effect on the teeth of adults.

   d) Some large cities have had fluoridated water for several years.

6. Which of the following provides the <u>best</u> reason for <u>not</u> having fluoridation?

   a) Fluoridation causes a great deal of controversy.

   b) Several groups affiliated with medicine have stated their opposition to fluoridation

   c) In the past, substances added to foods have proved harmful.

   d) Recent research demonstrates that fluoridation can cause physical illness.

QUESTIONNAIRE PART III

INSTRUCTIONS

This third part is like Part II: in each item you will be asked to mark only the one correct answer.

Example: Assume that the following are facts which are relevant to chlorination (putting chlorine in the public water supply).

Which of the facts is most important in helping to decide whether or not chlorination is a useful practice?

a) Chlorination is cheap

b) Chlorination helps kill dangerous things in the water supply

c) Chlorination is simple to administer

d) Chlorination does not have to be voted on

Again, work carefully, but do not take too long on any one item.

Please do not refer back to the previous parts.

When you have finished this part, wait until the word is given to start Part IV.

Questions 1 - 6 refer to the following imaginary situation:

picture the following situation.

A group of infants are busy playing with flowers and books. Suddenly, the government's Director of Learning presses a button. There is a violent explosion. A loud siren shrills maddeningly. Bells clang, louder and louder. The infants shrink away from the flowers and books in horror. "Now, they'll grow up with what we used to call an 'instinctive' hatred of books and flowers," said the Director of Learning.

1. Which of the following shows a preference for one side of an issue?

   a) Some infants grow up with a dislike for books and flowers.

   b) Many infants are afraid of loud noises.

   c) The government should not control what children learn.

   d) What people call "instinctive" hatreds may be learned.

2. A consequence of controlling what infants learn is that

   a) children will no longer want to play

   b) children will lose some freedom to develop their interests

   c) artists and writers will lose their place in society

   d) parents will lose the respect of their children

3. Which of the following would provide the most valid evidence that the interests of infants can be controlled?

   a) Testimonies by parents of large families

   b) Official documents by government workers

   c) Published reports by independent researchers

   d) Religious interpretations by leading church officials

4. The control of infant learning described in the imaginary situation is <u>most</u> like the

   a) athletic training of a basketball team

   b) unsupervised play of youngsters on a playground

   c) selection of candidates in a political convention

   d) the military discipline provided members of the armed services

5. Which of the following provides a reason for <u>not</u> supporting complete government control of infant learning?

   a) The type of learning described in the imaginary situation is inefficient.

   b) The type of learning described in the imaginary situation is inexpensive.

   c) The type of learning described in the imaginary situation does not provide for individual interests.

   d) The type of learning described in the imaginary situation leads to a lack of conformity.

6. The <u>best</u> reason for opposing complete government control of infant learning is that

   a) complete control is frequently used in training animals

   b) many scientists oppose complete control in learning

   c) free choices may lead to intelligent decisions by individuals

   d) government control is undesirable

QUESTIONNAIRE PART V

INSTRUCTIONS

This fifth part is like Part II: in these items, you will be asked to mark only the one correct answer.

Example: Assume that the following are facts which are relevant to chlorination. Which of these is most important in helping to decide whether or not chlorination is a useful practice?

a) Chlorination is cheap

(b) Chlorination helps kill dangerous things in the water supply

c) Chlorination is simple to administer

d) Chlorination does not have to be voted on

Again, work carefully, but do not take too long on any one item.

Please do not refer back to any of the previous parts.

Questions 1 - 6 refer to the following paragraph.

An issue arises when people disagree about what should be done or how something should be done. In recent years people in the U.S. have disagreed about the rights of Negro citizens, the extent to which government decisions should affect the nation's economy, whether or not U.S. servicemen should be fighting in Viet Nam, and other issues. One issue that people have disagreed about for several years concerns the use of pesticides, that is, the application of chemicals to farm crops.

1. Which statement indicates a choice for one side of an issue?
   a) The destruction of farm crops by insects is widespread.
   b) The practice of using pesticides is undesirable.
   c) People often disagree over issues.
   d) Pesticides are chemicals that combat the destruction of crops by insects.

2. One consequence of the use of pesticides is that
   a) more farm crops will be destroyed by insects
   b) citizens must take a position over public issues
   c) some soil and water will be spoiled by chemicals
   d) important public issues will not be dealt with

3. Some systematically based support for NOT using pesticides is provided by
   a) scientists who have identified the dangers of pesticides to human beings
   b) religious groups who believe that the fundamental processes of nature should not be offended
   c) children who have studied some of the negative effects caused by pesticides
   d) parents who are concerned about the bodily effects pesticides may have on future offspring

4. Which of the following is most like a situation in which pesticides contaminate soil and water?

   a) The injection of vaccines sharply reduces epidemics.

   b) The use of insulin controls the effects of diabetes.

   c) The electrical stimulation of the brain results in dramatic changes in behavior.

   d) The use of birth control pills results in the birth of deformed babies.

5. Which of the following expresses a reason supporting the use of pesticides?

   a) The use of pesticides has reduced the amount of farm crops destroyed by insects.

   b) Most of the areas sprayed with pesticides had no pests prior to the spraying.

   c) Insects may become immune to insecticides.

   d) New and more powerful pesticides have to be developed constantly.

6. The <u>best</u> reason for NOT using pesticides is that

   a) using pesticides is inadvisable

   b) some noted scientists are against it

   c) like other poisons, it may be dangerous

   d) it has produced some serious illnesses in man

APPENDIX VI

Free-Response Items

NAME_____ DATE:_____
(Please print clearly)

QUESTIONNAIRE PART I

INSTRUCTIONS

This questionnaire is made up of five parts, each with somewhat different kinds of questions.

In this first part, you are to answer each question briefly in the space provided below the question.

Example: In the space below, write a sentence in which you use the word "inoculate" with its proper meaning.

We inoculate people to protect them against smallpox.

Work carefully, but do not take too long on any one item.

When you have finished this part, wait until the word is given to start Part II.

What do you feel is the most telling point against fluoridation?

Why do you think the issue of fluoridation has been given little unbiased attention?

As indicated in the passage you read on fluoridation, the president of the National Health Federation and the Royal Medical Board of Sweden are opposed to fluoridation. On the other hand, the American Dental Association and the American Medical Association are in favor of fluoridation.

a) How would you decide between these opposing groups?

b) How is this information relevant to voting on whether to adopt fluoridation in your community?

What was the main point of the passage on fluoridation?

What is the most important information to consider in deciding whether or not to adopt fluoridation in a community?

Suppose that you were the city manager of some community and you had to decide whether or not to introduce fluoridation. What would your decision be? Why?

State your views of fluoridation in 3 sentences.

Suppose that your view is that we should adopt a beneficial health practice unless there is some good reason to believe that it might produce a serious disease in humans. With this view, what would you decide on the advisability of introducing fluoridation? Why?

Suppose that a process is developed to bombard foods with radioactivity and thus preserve the foods for a long period of time. What factors would you consider in deciding whether to buy food that has been treated this way?

QUESTIONNAIRE PART IV

INSTRUCTIONS

This fourth part is like Part 1: answer each question briefly in the space provided below the question. The example from Part I is reproduced here for your convenience.

Example: In the space below, write a sentence in which you use the word "inoculate" with its proper meaning.

We inoculate people to protect them against smallpox.

Again, work carefully, but do not take too long on any one item. Please do not refer back to any of the previous parts.

When you have finished this part, wait until the word is given to start Part V.

What do you feel is the most telling point against the use of pesticides?

Why do you think the issue of the use of pesticides has been given little unbiased attention?

As you read in your passage on the use of pesticides, Rachel Carson and the St. Louis Citizens' Committee for Nuclear Information are opposed to the present procedures in the use of pesticides. On the other hand, the U. S. Department of Agriculture and the National Farm Bureau favor the use of pesticides

a) How would you decide between these opposing groups?

b) How is this information relevant to suggestions you would make to your Congressman about governmental control of pesticides?

What was the main point of the passage on the use of pesticides?

What is the most important information to consider in deciding whether or not to allow the use of pesticides?

Suppose that you were a county agricultural agent and you had to decide whether or not to allow the use of pesticides. What would your decision be? Why?

State your views of the use of pesticides in 3 sentences.

Suppose that your view is that we should adopt a helpful practice unless there is some good reason to believe that it might produce a serious disease in humans. With this view, what would you decide about the advisability of using pesticides on farm crops? Why?

Suppose drug X is put on the market and advertised as a means of birth control. What factors would you consider in deciding whether to use the drug?

APPENDIX VIII

Category System for Free-Response Items

1. Harmful
   a. Statement
      "It is harmful." "It is not harmful."
   b. Conditional
      "If it is harmful." "If it is not harmful."
   c. Question
      "Is it harmful?" "Is it (not) harmful."
   d. Possibility
      "It might (may, could, etc.) be harmful."
      "It might (may, could) not be harmful."
      "It hasn't been proven harmful."
   e. Statement implying harmful effects
      "It gets into the ground." -- (no mention of harmful).

2. Effectiveness
   a. Statement
      "It is effective, helpful, etc."
      "It is ineffective, not helpful, etc."
   b. Conditional
      "If it is effective, then . . . " "If it is ineffective, then..."
   c. Question
      "Is it effective?" "Is it ineffective?"
   d. Possibility
      "It might be effective." "It might not be effective."
   e. Statement implying effectiveness - non-effectiveness.
      "It only helps a few."

3. Costliness or Wastefulness
   a. Statement
      "It is wasteful, costly, too costly."
      "It is not wasteful, costly, etc."
   b. Conditional
      "If it is wasteful, costly, then . ."
      "If it is not wasteful, costly, then . . ."
   c. Question
      "Is it wasteful, costly, etc.?"
      "Is it not wasteful, costly, etc.?"
   d. Possibility
      "It might be wasteful, costly, etc."
      "It might not be wasteful, costly, etc."

4. Liberty of the People
   a. Statement
      "it violates rights." "It doesn't violate rights."
   b. Conditional
      "If it violates rights, then . . ."
      "If it doesn't violate rights, then . . ."
   c. Question
      "Does it violate rights?"
   d. Possibility
      "It might violate rights."
      "It might not violate rights."

5. Control or Limit
   a. Statement
      "It is controlled." "It is uncontrolled."
   b. Conditional
      "If it can be controlled, then . . ."
      "If it can't be controlled then . . ."
   c. Question
      "Is it controlled?" "Is it uncontrolled?"
   d. Possibility
      "We might not be able to control it."
      "We might be able to control it."

6. Approval by Authority
   a. Statement
      "I am for the AMA." "I am not for the AMA."
   b. Conditional
      "If my family doctor says it's safe, then I would use it."
   c. Question
      "Does AMA say this?"
   d. Possibility
      "My family doctor might say it's O.K."

7. More Harm than Good
   a. Statement
      "It does more harm than good."
   b. Conditional
      "If it does more harm than good, then . . ."
   c. Question
      "Does it do more harm than good?"
   d. Possibility
      "It might do more harm than good."

8. More Good than Harm
   a. Statement
      "It does more good than harm."
   b. Conditional
      "If it does more good than harm, then . . ."
   c. Question
      "Does it do more good than harm?"
   d. Possibility
      "It might do more good than harm."

9. Necessary
   a. Statement
      "It is necessary." "It is unnecessary."
   b. Conditional
      "If it is needed, then . . ."
      "If it is not needed, then . . ."
   c. Question
      "Is it necessary?" "Is it unnecessary?"
   d. Possibility
      "It might be necessary."
      "It might not be necessary."

10. Decision other than Yes-No
   a. Statement
      "Let the people decide."
   b. Conditional
      "It needs more research."
   c. Question
      "Let the farmers decide."
   d. Possibility
      "We need more information."

11. Unqualified Acceptance or Rejection
   "Yes, I would." "No, I wouldn't."

12. Inappropriate Responses
   "It helps kill bad things in the water."

13. Inadvisability
   a. Statement
      "It is inadvisable." "It is advisable."
   b. Conditional
      "If it is inadvisable, then . . ."
      "If it is advisable, then . ."
   c. Question
      "Is it inadvisable?" "Is it advisable?"
   d. Possibility
      "It might be inadvisable."
      "It might be advisable."

14. Good and Bad Points
   "We must look at good and bad points." "There are good and bad points."

15. Gives Information
   "It tells us what people think of fluoridation."

16. Aesthetic
   "It affects taste."